

The Potato News Bulletin

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KIWANIANIS SPONSOR POTATO CLUB WORK

P. R. Young, Assistant State Club Leader
Ithaca, N. Y.

The National program of Kiwanis calls for efforts toward a better understanding between city and country people. Two New York state clubs carried through very concrete efforts in that direction last year—the Kiwanis Clubs of Troy and Syracuse.

The former was the first to undertake the work, being persuaded by County Club Agent Hoefer of Rensselaer county that the 4-H Club Work offered them the opportunity they sought. The plan, also adopted by the Syracuse Kiwanians, was as follows:

About 50 Kiwanians of Troy agreed to work with as many boys of the county round about, one man to one boy. The man was to supply the boy with from one to three bushels of certified seed potatoes in the spring, to visit the boy and his potato patch at least once during the summer, and to entertain him and his dad at the roundup on Achievement Day in the fall. The boy agreed to enroll as a regular 4-H member with the County Club Agent, to plant and care for the potatoes to the best of his ability, to exhibit at the fairs and on Achievement Day, and to come, bringing his dad with him, to the latter event, at which time he was to pay for his seed potatoes, in cash or potatoes.

Special prizes were offered by the Kiwanis Club, as an organization, for the best work done, judged on the basis of yield, records, effort, etc.

The fall achievement day, for both the Troy and Syracuse clubs, was observed in November. A talk by a potato specialist, the exhibit of the boys' potatoes, a dinner, awarding prizes, and an afternoon at the theater, comprised the programs. The country boys and their dads had an opportunity to really get acquainted with the city men and vice versa. Country and city men met in a common interest, the boys. As for the boys themselves, they had a "whale of a time", and a vision of city and country working and playing together, which cannot but have its influence.

It is understood that the state Kiwanis organization has endorsed the idea behind the work of the two cities as described, and an extension of the plan is expected. It seems to avoid many

of the evils that go with promiscuous giving or charity. It substitutes the idea of the helping hand, interest, and fellowship, all of which are returned by the recipient. The result is progress and achievement, instead of complacent gratitude.

BE GENEROUS WITH SEED POTATOES THIS YEAR

**E. V. Hardenburg, Dept. of Vegetable Gardening
Cornell University**

Regardless of present potato prospects for 1925, there seems to be no good reason why potato growers should try to economize on seed used in planting this year's acreage. Altho good seed is always cheaper in the end than poor seed, certified seed potatoes can be bought actually cheaper this year than usual.

Nearly all of the experiments testing the relation of size of seed piece planted to yield have given results favoring the larger pieces up to at least hen's-egg size. Usually the number of bushels necessary to plant an acre has increased as the size of seed piece has been increased. In other words, the average results of these tests have favored the use of not less than 15 nor more than 20 bushels of seed to the acre.

Whether 15 or 20 bushels of seed will give highest net yield is determined by such factors as soil fertility, available soil moisture and weed control. More seed can be used with profit under favorable than under unfavorable growing conditions. However, the average amount of seed now used in New York State is approximately 12 bushels, some growers planting as little as 6 bushels.

With the lower rates of planting, poorer stands of not only fewer but often weaker plants result. It costs as much to plow, harrow, fertilize, plant and cultivate a poor stand of potatoes as a good one. And more than half the total cost of producing this crop is cost of labor. While farm labor is relatively expensive and good potato land none too plentiful, why not be both conservative and economical by planting only our best soils to potatoes and planting that best so as to be sure of a good stand. This can be done by using not only better seed but more of it.

More seed can be profitably used by planting the hills closer in the row or by using larger seed pieces or both. A missing hill is less likely to be missed under drill or close planting than under checkrow planting. A missing hill in a field planted 3 feet by 3 feet results in more or less waste of 9 square feet of soil area.

At our present rate of increase in potato production, we need not more but better quality potatoes. The use of more seed by closer planting will help increase the yield per acre, reduce the necessity of planting a larger acreage, improve quality by eliminating oversize and hollow-heart tubers and cheapen the cost per bushel. It is poor economy to be stingy of seed this year.

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THE POTATO NEWS BULLETIN

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MEMBERSHIP

Our membership is constantly growing and once in awhile by leaps and bounds. The writer has just received a letter from H. C. Moore, Extension Specialist of the Michigan Agricultural College in which Prof. Moore states,—“In a few days I will forward you another membership list.” Since the first of March, Prof. Moore has sent in 81 memberships and practically in the same period Prof. W. J. Weston sent in 43 more for the state of Michigan. The large number of Michigan growers joining the Association verifies the statement made by Prof. Moore, and printed in the March number of this publication.—“Our growers are keen students and progressive men.” By reading The Potato News Bulletin they will obtain a better understanding of the potato industry and become more successful growers.

Recently Prof. Wm. Stuart, our secretary-treasurer, notified the various members of the membership committee. Names of this committee are printed elsewhere in this number. This is a large committee and much is expected from each member of it. They are given the authority to appoint others to assist them. The writer would like to suggest that if any member of this committee should have the opportunity to secure a member outside of his state or province do not hesitate to do so. You have no boundary

when it comes to getting new members. The world is before you and if you can get some on Mars don't let the opportunity pass by.

It may be an interest to the readers to learn that there are now readers of this publication in England, France, Orange Free State in the southern part of Africa, Russia and Scotland.—**Walter M. Peacock.**

THE ANNUAL REPORT

During the last month the Annual Report for the year of 1924 has been distributed to last year's members. This is an excellent report and does credit to those who had charge of the program for the annual meeting, those who took part and to Prof. Stuart, who has had charge of publishing it. At the meeting 27 papers and 7 reports were presented. Most of the subjects presented by these 27 papers were classified under the following topics,—“Seed potato improvement,” “Rest period and storage of potatoes”, “Potato spraying and dusting”. Any one interested in these subjects will find it profitable to read this report. One hundred and twenty-five extra copies were printed and these are on sale at \$1.00 per copy. If you wish a copy simply send a check for \$1.00 to Prof. Wm. Stuart, U. S. Dept. of Agr., Washington, D. C.—**Walter M. Peacock.**

THE RECENT S. O. S.

When a message was sent out to the four corners of the earth on April 30th for material for this number of The Potato News Bulletin there was scarcely enough for two pages. The response was very prompt and gratifying and denotes the kind of cooperation a fellow needs when he is in a hole, or on a sinking ship. It demonstrates that we are working together to make this publication worth while. To all who contributed, I thank you.

The effort that has been put forth in a short period is turning out one of the best, if not the best number yet published. If this is the result of a short-time notice much will be accomplished when the work of the publication is better organized.

A. R. Talmage, in complying with the request not only sent an article but gave the following suggestions in a letter—“The only way to get material is to go after the fellows that you want to come across with something. I believe that most of them will if they are asked. Why not ask men closely connected with the potato industry in all lines to give some short items or reports on things that have impressed them. Those men might include inspectors of both certified seed and table stock, fertilizer experts,

potato shippers, dealers in the cities, transportation companies, growers and others."

Prof. R. W. Goss, chairman of the Research Committee, in his article entitled "Suggestions for the Research Committee" also gives some excellent advice along the same line. The Editor hopes every member will read this article found elsewhere in this number.

A movement has been started to get the work connected with this publication better organized and it is hoped that the time will soon come when a list of articles will be available in advance, the articles obtained and filed for future numbers. As much care should be given in making out the list for the leading articles as in making out a program for a meeting.

Items concerning the acreage being planted, the condition of the growing crop, harvesting and sale of the crop from every potato section are always needed and should be up-to-date as nearly as possible.—**Walter M. Peacock.**

AN APPEAL FOR THE FUTURE POTATO GROWERS

The spirit set forth in the article written by P. R. Young is to be highly complimented and the Kiwanis Clubs of Syracuse and Troy, N. Y. are to be congratulated on the splendid work they have started. The potato growers of tomorrow cannot be given too much encouragement.

In the rural districts and elsewhere strong leaders are needed today and the present indications are that there will be a demand for stronger ones in the future. Although the training and responsibility connected with junior club work is invaluable regardless of whether the youth stays on the farm or finds an occupation in the city, the experience gained will help to solve either rural or municipal problems in the future. However, the chances are that the boy who learns how to grow two to four bushels of potatoes of fine quality where probably his dad raised one and that perhaps of an inferior quality will be satisfied and contented with farm life. He will form a more favorable attitude toward farming and will want to stay on the farm. He will have an opportunity to learn and earn.

The youth in any kind of club work should be encouraged to study the essential features of the subject. There is nothing that will supplant a well-rounded and high-class periodical devoted to the subject. Usually there is not such a volume of material at any one time and there is always something to look forward to from month to month. Reading a book on the subject is likely to become tiresome. For this reason the short story is very popular today. Articles in a weekly or monthly publication have the same psychological effect; they are usually timely thereby stimulating great interest.

There is no better periodical for members of potato clubs than **The Potato News Bulletin**. This publication will stimulate an interest in the potato project from month to month. It will create a desire for study and experimentation which eventually will help the potato growers of tomorrow to solving their own problems is the type desired in the future. In making this statement the writer does not mean that the present farmers are not solving any of their problems. They are solving many problems for themselves and would solve more if they were better informed.

King Solomon wisely said, "Train a child in the way he should go and when he is old he will not depart from it. Wisdom is the principal thing; therefore get wisdom and with all thy getting get understanding; exalt her and she shall promote thee." Therefore, in regions well adapted for potato production teach the boys of today how to produce high quality potatoes at a low production cost. Knowledge is something that no one can take from these youthful chaps.

The Kiwanis, Lyon and Rotary Clubs will find it profitable in many respects to assist the junior club workers. The writer hopes that many of these city clubs will avail themselves of the opportunity to lend a helping hand in this worthy field of work by pursuing a course similar to that followed by the Kiwanis Clubs of Syracuse and Troy, N. Y.—**Walter M. Peacock**.

THE CERTIFICATION OF POTATOES

In a recent number of "The Eye" Mr. W. C. Edmundsen of the Colorado Experiment Station at Greeley mentioned that much seed stock was being shipped into that territory which was marked as certified seed but that the certification was concerning such matters as soil, cultural conditions, etc., and that the stock was by no means real certified seed as we understand that product.

In a previous number of the Potato News Bulletin special attention was called to the seriousness of the practice which seems to be prevalent all over the United States, of unscrupulous people taking unfair advantage of the word "certified" as connected with seed potatoes. Since that statement was written, the writer has learned of many other instances wherein spurious tags were attached to very ordinary or sometimes extremely poor potatoes which were sold by innocent and well meaning growers as real certified seed.

It seems that one of the best things that members of the Association can do is to inspect any shipments of potatoes coming into their locality which are represented as certified seed and if doubtful concerning the authenticity of such certification make inquiry of the official certification agencies in the state in which the ship-

ment originated. Undoubtedly many farmers who buy this misrepresented seed stock never learn until too late that they have not received real certified seed. This of course does serious damage to the reputation of the legitimate certified seed which is being grown at the expense of much money and time by the potato growers in the various states.

It might also be well for any party upon becoming acquainted with the facts concerning any of these instances of misrepresentation to secure as much information as possible, especially evidence in the way of literature and tags and forward same to one of the members or the chairman of the Certification Committee of the Association. Dr. W. H. Martin, Agricultural Experiment Station, New Brunswick, N. J. is the Chairman of this committee. Other members are located in various parts of the United States and Canada. The membership of this committee is announced in this number of the Potato News Bulletin.

The officers of the Potato Association of America will be very receptive to ideas concerning what steps the Association could take toward curbing or eliminating this practice which is detrimental not only to the certified seed potato grower but also to the purchasers of seed potatoes.—H. O. Werner.

BOOST YOUR PUBLICATION

Boost and contribute to The Potato News Bulletin and it will become better and better each month in every way. There is more pleasure in boosting and contributing than in knocking or remaining idle. Take advantage of every opportunity to help make The Potato News Bulletin a **better** publication and to boost it. If every reader will follow the above suggestions the ultimate results will go beyond all expectations.

The editor received the following letter from Mr. Clarence W. Holland, Eastville, Virginia.—“I am desirous of subscribing to The Potato News Buletin, published by the Potato Association of America. I have been referred to you by Mr. Alex. McPherson of Presque Isle, Maine. Kindly advise me in reference to the price of subscription so that I may send you a check for the same.”

Mr. McPherson has the boosting spirit and his force of suggestion stimulated a desire in Mr. Holland's mind to become a subscriber. Other readers are demonstrating this spirit too and some of their accomplishments have been acknowledged in this publication. The writer is mentioning this case to show what can be done by boosting The Potato News Bulletin even in a distant state.

Boost The Potato News Bulletin to your neighbors and to other potato men that you meet while traveling along life's pathway.
—Walter M. Peacock.

CONCENTRATED FERTILIZERS

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**B. E. Brown, Biochemist, Bureau of Plant Industry,
 U. S. Department of Agriculture, Washington, D. C.**

To quite a large extent those interested in various fertilizer problems up to recent years have thought in terms of certain well-known materials at least primarily so with respect to the mixing of raw materials to form commercial fertilizers. As a matter of fact, the fertilizer industry has developed to a large extent around such materials. These well-known raw materials include (1) nitrate of soda and sulphate of ammonia which embrace the chief inorganic nitrogen carriers, (2) acid phosphate, chief carrier of phosphoric acid (3) various potash salts, those of leading interest to potato producers being the muriate and sulphate (4) various by-product materials of an organic nature such as fish scrap, tankage, dried blood, cottonseed meal, etc. (5) calcium cyanamid, an organic nitrogen salt whose nitrogen is derived from the atmosphere. While there are other important materials employed in the fertilizer industry, like kainit, manure salts, etc., it is not deemed necessary to mention additional materials being used.

In order to provide the huge tonnage of mixed goods and individual fertilizer salts now required by our farmers, horticulturists, vegetable gardeners, etc., from season to season there has been built up a tremendous system necessary to move the raw materials. Nitrate of soda alone means transporting close to a million tons of this goods from Chile, while potash salts from France and Germany will approximate 750,000 tons of potash salts. Concerning domestic movements of fertilizer materials is the transfer of immense quantities of acid phosphate and the movement of slaughterhouse by-products, of fish scrap, of cottonseed meal, and other materials.

When one attempts to consider the fertilizer industry in its entirety, and this includes home-mixing and the use of individual fertilizer materials like nitrate of soda or sulphate of ammonia, it is realized that the volume of raw materials moving to the plant, whether factory or farm, is very great. Hauling, handling, mixing, curing, bagging, selling, shipping and other essential features also have to be considered before the mixed goods are used by the farmer.

Not so many years ago it was comparatively easy to purchase "low-analysis" goods like 1-8-1 or 2-8-2. There were manufactured also a multiplicity of brands. This state of affairs existed for a good many years until, recently, a rather definite educational campaign was conducted cooperatively by various Agricultural Experiment Stations, the United States Department of Agriculture and the Soil Improvement Committees of the fertilizer industry for the purpose of materially reducing the number of formulas containing less than 14 units of plant food. This meant standard-

ization and anything below the standard set by mutual consent is to be looked upon with slight favor. The important result forthcoming has been that a number of the leading fertilizer-using states and regions have decided upon not only advocating "high-analysis" goods but to limit the number of formulas strictly to the requirements of their crops and soil types. The fertilizer industry has cooperated, recognizing the value of standardization and the elimination of so many brands. We might call this one of the most important movements connected with the manufacture and use of ordinary fertilizers.

The advantages of "high-analysis" over "low-analysis" goods are obvious, including less hauling, handling and storage space. Much less material and work are required at the factory per ton of fertilizer and by reducing or cutting out so many superfluous brands still greater savings can be made due to this standardization. The matter of saving on freight is an important, if not the most important, item.

In the field the farmer has fewer bags to handle but no less plant food.

We now come to a movement which was started recently, namely, the suggested use of concentrated fertilizers. This movement is, in effect, a proposal to go a step, a considerable step, beyond the term conveyed by "high-analysis." We have always had high-analysis or high grade fertilizers, such as 4-8-4, 4-8-6, 5-8-7, etc., but in all such cases the regular custom has been to mix the various ingredients with sufficient filler or conditioner to make a ton. In such cases the maximum quantity of plant food rarely exceeds 20 units of plant-food.¹ A 5-8-7 formula, containing 20 units of plant food, would be considered, under present commercial standards, a high-grade fertilizer, and so it is. It contains 5 units of ammonia, 8 units of phosphoric acid and 7 units of potash. This means, of course, 400 pounds of plant food per ton of fertilizer leaving 1600 pounds not considered plant food.

If we reverse the above and have 1600 pounds of plant food and 400 pounds of inactive material, the result is a concentrated fertilizer. Another way of expressing the comparative strength of ordinary and concentrated fertilizers is that 2000 pounds of the former is equivalent to 500 to 750 pounds of the concentrated depending upon the character of salts used. In order to accomplish this it is essential to employ concentrated salts. Such mixtures are possible by the use of salts like ammonium nitrate, ammonium chloride, urea, ammonium phosphate, potassium phosphate, potassium nitrate, and potassium sulphate or potassium chloride. The following table will show the high concentration of some of the salts being used in the preparation of concentrated fertilizers as

1. A unit of plant food is 20 pounds or 1 per cent of a ton.

compared with the ordinary fertilizer salts. The percentages of ammonia, phosphoric acid and potash are given:

	Per cent Ammonia	Per cent Phosphoric acid	Per cent Potash
Ordinary Fertilizer Materials.			
Nitrate of soda	19.0		
Sulphate of ammonia	25.0		
Acid phosphate		16.0	
Sulphate of potash			50.0
Muriate of potash			50.0
Dried blood	16.0		
Fish scrap	10.0	(a)	(a)
Tankage	10.0	(a)	(a)
Cottonseed meal	8.0	(a)	(a)
Concentrated Fertilizer Salts.			
Ammonium nitrate	42.0		
Ammonium phosphate	14.0	60.0	
Ammonium chloride	31.0		
Urea	56.0		
Potassium nitrate	16.0		44.0
Potassium phosphate		52.0	34.0

(a) Also contain phosphoric acid and potash.

By comparing these two classes of salts it is at once evident that the latter group possesses much greater concentration of plant food per unit weight. Some of the salts in the concentrated group like ammonium phosphate and potassium nitrate, while low in one constituent, ammonia, more than offset this by their high concentration in phosphoric acid and potash, respectively. It is practicable to include either the muriate or sulphate of potash in the concentrated group due to their high concentration of potash (K_2O).

The concentrated salts and, hence, concentrated fertilizers are chiefly possible due (1) to the production of nitrogen salts or ammonia through the fixation of atmospheric nitrogen and (2) the production of phosphoric acid from rock phosphate by smelting processes. By combining the ammonia produced by the first process, or an alkaline potash salt, with the phosphoric acid produced by the second process salts can be made containing two plant food elements. Or the ammonia can be neutralized with nitric or hydrochloric acid to form ammonium nitrate or chloride.

Urea, the most concentrated of any of the nitrogen carriers, is produced from calcium cyanamid or from the interaction under certain conditions of ammonia and carbon dioxide.

With these various salts as a starting point cooperative studies are being made to determine the effect of certain mixtures and

formulas on the growth and yield of prominent crops in different sections of the country. The chief crops included in the field investigation are the following: Potatoes, sweet potatoes, cotton, wheat, corn, celery, lettuce, and sugar beets. The potato work is being conducted on prominent soil types in New Jersey, on Long Island, and in Maine; the wheat experiments are located in Virginia, at Arlington Farm, in Indiana, Maryland and Pennsylvania; the cotton experiments are placed in North Carolina, on two soil types, and in South Carolina; the lettuce and celery work is being conducted in Florida; the corn experiments are located in Virginia, on Arlington Farm, in Indiana and Pennsylvania; the sugar beet work is located in Colorado; the sweet potato work in North Carolina.

Five types of mixtures are being used. One contains ammonium phosphate, potassium phosphate, potassium nitrate and ammonium nitrate; a second contains ammonium phosphate, urea and potassium sulphate. These two mixtures are used in concentrated form and also diluted to the ordinary ton basis with suitable filler. The fifth mixture, the control, is designated "Commercial", and contains the ordinary fertilizer materials. It is made up on the ton basis. In addition, provision has been made to leave certain areas unfertilized in order to have further check on the effect of the various fertilizer treatments.

The work in the main is being carried on in cooperation with leading farmers who have assigned land for such purposes. The size of plot allotted to each treatment is approximately one-fourth acre so that the proposition from an experimental standpoint is on a fairly large-scale basis. Considering the diversity of crops, soil type and range in climatic factors, it is to be hoped that considerable evidence of importance will be forthcoming this and other seasons.

One of the main questions which has arisen in connection with the use of concentrated fertilizers is whether such mixtures will tend to have an injurious effect either directly on germination or, perhaps, indirectly through excessive leaching of the highly soluble salts making up the concentrated mixtures. This is important question and one which it is believed will be satisfactorily answered through the experimental studies now under way. With respect to the results with potatoes it is likely that a report can be made in *The Potato News Bulletin* after the yield and other records are obtained.

The field work herein briefly discussed is being carried on by the Bureau of Plant Industry, through its Office of Soil Fertility Investigations, in cooperation with the Fixed Nitrogen Research Laboratory, the Bureau of Soils and the Bureau of Public Roads. These various Bureaus are interested in important problems connected with the matter of concentrated fertilizer salts and the mixtures made from them.

Briefly, the Fixed Nitrogen Research Laboratory is concerned primarily with the broad problems pertaining to nitrogen fixation processes with regard to recovery of nitrogen from the atmosphere; the Bureau of Soils is interested in the production of phosphoric acid from rock phosphate, in the formation of different concentrated salts and in the behavior of such salts in mixtures; the Bureau of Public Roads is concerned with certain fundamental and practical features connected with the mechanical distribution of concentrated fertilizer mixtures; the Bureau of Plant Industry is directly concerned with the effect of the concentrated fertilizers on the growth and yield of different crops, and their economic use in crop production.

In presenting this brief announcement of the work conducted with concentrated fertilizers it is hardly necessary to emphasize the great importance of our well-known fertilizer materials like nitrate of soda, sulphate of ammonia, acid phosphate, various potash salts and organic nitrogen carriers like fish scrap, tankage, etc. While such materials will continue for some time to play a leading part in our general fertilizer practice, yet it is entirely conceivable that a major chemical industry will develop for the purpose of manufacturing some of the highly concentrated fertilizer salts mentioned, particularly if the exigencies of economy or necessity call for a change in routine or production.

While the matter is more or less in an experimental stage, and the use of concentrated fertilizers will be a slow development contingent upon adequate supplies of the concentrated salts at prices in keeping with those of ordinary fertilizer materials, yet one is reasonably safe in predicting that the concentrated salts will gradually be used more and more in conjunction with ordinary fertilizer materials. The practical compromise may well be fertilizer mixtures not as concentrated as some may hope to see, but considerably more concentrated than the present ordinary run of fertilizer mixtures in which both classes of materials will be found of value. This will mean the judicious use of the concentrated salts along with our present ordinary materials in mixtures whereby the plant-food contained in a ton of ordinary fertilizer will be carried instead in two-fifths to one-half ton of material; thereby insuring mixtures not only with a high degree of concentration but possessing good mechanical condition which the farmer will learn to appreciate on account of the fact that such mixtures will drill readily and not cause him undue annoyance.

The advantages such concentrated mixtures possess will be less hauling, handling and storage space, less freight and other items associated with the assembling of fertilizer materials and the preparation of mixed fertilizers whether in the factory or on the farm.

OLD POTATO SEASON CLOSING WEAK

(Contribution from the Fruit and Vegetable Division, Bureau of Agricultural Economics, U. S. Dept. of Agriculture.)

Some price advances occurred during April, but by the end of the month old potatoes were approaching the close of the season with supplies abundant and markets generally weak. New southern stock was fast pushing northern potatoes into the background. Some factors still looked for higher prices before the shipping period ends, but the recent trend was decidedly downward. The 25 per cent decrease in weekly shipments which occurred during the seven days, April 19-25, was expected to steady the market somewhat, but supplies of new stock were becoming heavier each day. Output for that week was about 3,000 cars, with heaviest decreases in Maine and Minnesota. Maine still held leading place, however, with the week's movement 885 cars; western New York shipped 400, and several other States 200-300 each. Minnesota and New York shipments were running about the same as the year before, but the weekly volume from Maine, Idaho and Washington was considerable heavier. Michigan and Wisconsin showed lighter movement than in late April, 1924. To April 25, the combined output of 18 leading States totaled 163,300 cars, or 15,000 less than to the same time last season and 5,000 less than the record two years ago. About 15,000 additional cars were shipped between May 1 and the end of the 1923-24 season.

Bulk Green Mountains dropped to 35 cents per 100 pounds at Maine shipping points, which was lowest mark of the season. The New York City price declined to 95 cents to \$1.10. North Central shipping sections closed lower at 55 cents-65 cents for sacked round whites, and a 10 cents-15 cents decline during the week ending April 25 brought the Chicago carlot market to a level of 65 cents-75 cents. New York round whites ranged 90 cents to \$1.15 in eastern consuming centers, against \$1.65-\$2.00 a year ago. With western potato stocks very low, Colorado white varieties maintained an average of \$1.75 in Texas carlot markets, and Idaho Russets touched \$2.75 in Chicago. Possibly less than 1,000 cars of potatoes remained in Idaho and only 600 or 700 in the Yakima Valley of Washington. Holdings in the city of Los Angeles were about one-third those of mid-April, 1924.

Idaho growers appear to have had a satisfactory market season, even though liberal supplies of cheaper mid-western stock curtailed Idaho's shipments to the East. A considerably greater percentage was sent to California markets than during the 1923-24 season. Production in all the far-western States was relatively light, as a result of scarcity of irrigation water, and average yields were somewhat below normal. Idaho growers received anywhere from 60 cents per 100 pounds in October to \$1.50 in February for bulk U. S. No. 1 Russets. Sacked Rurals ranged from 50 cents to \$1.00

per 100 pounds, cash to growers, during the season. Spring opened early, and mid-April conditions were ideal for farming operations. It was predicted locally that the acreage in the late-potato sections of Idaho would not be materially changed this year. The proportion of Russets possibly will be increased and that of Rurals decreased slightly. Heavy snowfall in the mountains during the winter will provide ample irrigation water this season. In the Nampa-Caldwell, or early-crop section of Idaho, it was expected that acreage would be reduced from one-half to two-thirds, because of the poor returns last fall. About half the seed shipped in this year has been Russets. Colorado growers also report a fairly satisfactory season, with average returns above the cost of production. Less competition than usual was met in the markets of Texas.

NEW POTATOES IN LIBERAL SUPPLY

During the week ending April 25, movement of new potatoes increased to 1,350 cars, nearly twice the output of the previous week and of the corresponding period last year. Florida was credited with 975 cars, Texas 300, and Louisiana 75. Shipments were starting in Alabama and Georgia. Total southern potato shipments had already exceeded 3,400 cars, compared with 1,400 to late April, 1924, and only 1,100 cars to the same time in 1923. Quality of Florida stock was exceptionally good, with a very high percentage grading U. S. No. 1. Many fields yielded from 60 to 75 barrels per acre, and local opinion was that the average for Hastings district would be around 50 barrels. Though plantings were less than in 1924, Florida had already shipped 1,500 cars more than to a corresponding date last season. City markets were liberally supplied, and the jobbing price declined further to a range of \$5.50-\$6.50 per barrel on best Florida Spaulding Rose and \$3.50-\$4.00 per 100-pound sack on Texas Bliss Triumphs. The f. o. b. price dropped to \$4.00 around Hastings, Fla., with shipments at their height. A big crop of potatoes in the Lower Rio Grande Valley of Texas had resulted in moderate price levels; closing f. o. b. quotations in late April were \$2.50 per sack.

Much lighter acreage than last year is reported in the Eagle Lake—Wharton section of Texas. Reduced plantings also are indicated in most parts of southern California, so that the Shafter district, near Bakersfield, probably will be the chief source of late-spring supply for California markets. Dry weather was hindering development of Mississippi's crop, but shipments were expected to start in mid-May. In South Carolina there are slightly over 14,000 acres, compared with 19,000 last year. The Charleston and Beaufort sections reported the stand better on earlier plantings, but an average of 85 per cent was estimated for all plantings. Growing conditions had been favorable, and first shipments were expected about May 5, with the main crop ready by the middle of the month and most of the digging completed by early June.

Potato area in North Carolina is estimated about 15 per cent, or 3,900 acres, less than that of 1924, and shipments should start the latter part of May. In Georgia, Chatham County has 1,000 acres of potatoes, compared with 1,300 last year, and the entire Savannah section has 1,300 acres, against 1,700 in 1924. Stand and growing conditions were good; movement begins in a heavy way around May 15. In the Norfolk section of Virginia there are 12,000 acres, a decrease of 4,000 from the 1924 plantings, and the stand in many fields is poor, averaging 80 per cent for the entire section. The crop is earlier than a year ago, with first shipments expected in late May or the early part of June. Eastern Shore of Virginia shows a 15 per cent decrease from the 80,000 acres of last year. Condition of the crop is reported fairly good, and carlot movement should begin before June 10, becoming heavy by the 20th.

Potato growers and shippers, who are interested in the number of cars unloaded in leading markets during 1924 from each State of origin, can obtain such statistics from the Fruit and Vegetable Division, Bureau of Agricultural Economics, Department of Agriculture, Washington. Ask for the mimeographed sheet, showing the 1924 potato unloads in 36 city markets. Similar reports for Pennsylvania cities can be secured from the State Bureau of Markets, Harrisburg, Pa.

POTATOES NOW STORABLE UNDER THE U. S. WAREHOUSE ACT

Paul M. Williams, Marketing Specialist

Potato growers, dealers and cooperative associations can now enjoy the privileges under the U. S. Warehouse Act which have heretofore only been available to producers of cotton, grain, wool, tobacco and farmers' stock peanuts.

The recent inclusion of potatoes under the U. S. Warehouse Act makes possible the licensing by the Secretary of Agriculture of responsible public warehousemen who can qualify under the law to accept potatoes for storage and issue therefore the Federally licensed warehouse receipt. This receipt enjoys the confidence of the banking fraternity of the country, being the highest grade collateral of its kind.

The Warehouse Act was passed by Congress in the hope that it would accomplish several purposes. First, that it would encourage the farmer to so store his products that he would avoid the terrific losses sustained each year through lack of proper storage for harvested crops. Another purpose was to create a uniform system of warehousing throughout the country for agricultural products. The most important consideration was to make possible a form of warehouse receipt possessing real loan value.

The Act provides for licensing inspectors and weighers to inspect and weigh potatoes in and out of licensed potato warehouses.

Federal warehouse examiners inspect the licensed warehouses several times each season to make certain that the potatoes are being properly cared for and that there are sufficient potatoes on hand at all times to cover all outstanding warehouse receipts. The examination system is modeled after the examination system under the National Banking Act.

It is believed that seed potato producers particularly will find the Federal warehouse receipt of much assistance in financing their operations. Provision is made in the law to preserve the identity of potatoes in the event the depositor so elects.

Information in detail with reference to the operation of the Act may be had by addressing the U. S. Department of Agriculture, Washington.

SPRAYING IN 1925

Daniel Dean, Nichols, N. Y.

American potato production has made relatively less progress in recent years in the direction of control of injurious insects and diseases by spraying than in other directions. This statement includes dusting as a promising future substitute for spraying.

Great progress has been made in the science and practice of spraying, but it has not been so rapidly and fully adopted as have other good practices.

By contrast, the most striking recent change in the potato industry is the immense production of certified seed in 1924, in addition to the quantities of high grade seed grown in 1924 from seed certified in previous years.

Marketing has made great progress in at least three directions, those of standardizing varieties in the different shipping sections, of better grading for the car lot market, and by better market news service.

The use of improved labor-saving machinery, from the tractor through to the digger and grader, has greatly reduced production costs, has helped to improve market quality, and has been a decisive factor in the development of specialized potato sections as Aroostock.

The shares of our potato crop that are planted to certified seed, are graded carefully before marketing, or are produced by the help of up-to-date potato machinery, are each far larger than the part which gets modern and up-to-date spraying for the control of injurious insects and potato diseases.

Seed potatoes are either "certified" or they are not. The grower must conform to clearly defined high standards, under close inspection by trained scientists if he wishes to have his stock "certified." Table stock is either "United States Grade Number One," or it is

not, with its well defined standard, and inspectors to enforce it. The grower who wishes to do good work in spraying finds few standards as well defined and enforced as these.

One reason for poor spraying in the past has been the great variation from year to year in the danger of loss from insects and disease. Any one, as the Colorado potato beetle, the leaf-hopper, or the late blight and rot may be absent one year, and a dangerous enemy the next. Growers have formed the habit of "taking a chance." The sale of certified seed has shown how much growers have learned to avoid taking chances with their seed.

The Colorado potato beetle was the original cause of potato spraying long ago. Perhaps it has been unfortunate for the potato industry that while this pest is sometimes hard to kill, in most years a very poor job of spraying with arsenicals, little better than a sprinkling will often control this insect. Spraying for the potato bug is frequently delayed until they are numerous on the vines, a bad habit for the potato grower to get into when he wants to spray for more serious troubles.

Hopper-burn, early blight and late blight and rot are each liable to occur over a wide area, and to be at times very destructive to potato yields. Though some attacks of each may be so light that a poor job of spraying will apparently control effectively, at any time an attack may come that takes the best possible spraying. Then it needs a "certified" or "United States Grade Number One" job of spraying to prevent a loss in yield which would mean loss instead of profit from every acre.

The habit of "taking a chance" has led to much neglect of spraying in the past, and too much spraying that has been but little better than none at all. Very few growers plan for their potato spraying with the same care and judgment that they give to the choice and care of seed, the buying of fertilizer, the planting and tillage of the crop and the marketing. Too often spraying is looked on as a necessary evil, to be avoided if possible, and in any case to be delayed until the insect or disease has had time to become well established in the field.

The past few years has seen a great change in the attitude of a few of the best potato growers towards spraying, a change which will within a few years extend to the rank and file, just as the use of certified seed, of better grading for market and better potato machinery has spread. In those areas where spraying may be needed to combat some insect or disease these leaders have learned to plan in advance for spraying as a vital part of potato production. The details of spraying must vary greatly with the climate, crop conditions and the enemy to be fought. The grower in the Red River Valley may think most of the potato bug, the grower of the east most of late blight, and perhaps the Michigan man may have his mind most on hopper-burn. In any case, the sprayer should be tested and put into perfect working condition at least a month in advance of the earliest date for use. One grower may buy only

"FRIEND" POTATO SPRAYERS

BEST BY TEST

NOW IS THE TIME TO INSURE YOUR 1925 POTATO CROP AGAINST BUGS AND BLIGHT. Don't risk losing your 1925 PROFITS. THE BEST WAY to save them is to spray thoroughly and the best way to Spray is with a "Friend". WHY throw away your profits to bugs and blight when it's so easy to save them with a "Friend"?

The "Friend" traction potato sprayer was the first satisfactory high pressure traction outfit made and there are now hundreds of delighted and satisfied users. "Friend" traction sprayers have direct pump drive, no grinding gears or snapping cracking chains, no sprockets. "Friend" high pressure plunger pump. A traction sprayer that is different and wherein it's different it's better. "Friend" gasoline power potato sprayers are unequalled for adaptability and service. Write today for complete information.



"Friend" Traction Sprayer at Work

"FRIEND" MFG. CO., Gasport, N. Y.

YOU'LL ALWAYS BE GLAD YOU BOUGHT A "FRIEND"

arsenicals for control of chewing insects. Another may buy mainly materials for making bordeaux mixture. A third may add contact insecticides for aphids. Whatever the materials to be used, they should be bought long ahead, perhaps in the winter.

The value of timeliness in spraying is now being appreciated as never before. As football players say, "Get the jump" on the enemy. The insect or the disease must find the plant covered with a protection of spray material which will kill either before it has time to become established and cause damage. It is much easier to prevent a fire than it is to put it out after it gets started.

The use of bordeaux mixture is fast increasing in many potato sections where formerly only arsenicals were used. This is due to appreciation of its great value in the control of the leaf-hopper and the flea-beetle. In the past many growers of the middle west have felt that late blight and rot did not come often enough to make spraying with bordeaux pay as a prevention. It is now clear that the use of bordeaux against these two insects often pays well in addition to its value against both early and late blight. Add to these factors the point that with bordeaux far less arsenicals are needed to control chewing insects than without it, and we see why bordeaux is increasing in popularity. The powerful high-pressure sprayer is coming in with bordeaux. In the cool and wet years bordeaux pays in the prevention of loss from late blight and rot.

Should the weather be hot and dry, bordeaux pays in the control of the insects and early blight.

Experience has shown that high pressures and good nozzle equipment increase the efficiency of spraying with bordeaux, and still more so with nicotine preparations. I have personally used over 200 pounds pressure for a dozen years, and last season used 290 pounds. Two or three nozzles per row, properly distributed, give a better coating of every part of the vine than only one. The number of applications must vary with conditions. Few growers begin early enough for best results in control of the various pests. Should late blight and rot be present in fields where potatoes are profitable, spraying should never be over two weeks apart, and one week may pay well. The season of 1924 showed the value of keeping on spraying until the vines were all dead, using a tops protector to prevent injury to the vines by the wheels. The doctor of the human patient may say that while there is life there is hope. With the potato vine, while there is life, there is danger, the danger of tuber infection by germs falling from the vines.

More than any other grower, the producer of certified seed is interested in spraying. Where insects or diseases may be controlled by spraying, the producer of certified seed finds in spraying a means of increasing his yield, and very often a means of improving its quality.

CENTRAL JERSEY POTATO FARMING

A. G. Waller

Potato farming in Central Jersey has been going through some necessary adjustments during the last three or four years. These adjustments have had to be made because of two factors which are, first, the individual farm itself and, secondly, the development in potato production of competing areas.

At the present time a survey is being made of all types of farming (potato, truck, general and dairy) in this area, by the United States Department of Agriculture, State Agricultural College and Experiment Station in cooperation. This survey is an analysis of the business on a number of farms that were analyzed ten years ago. This study of individual farm organization, reason for success or failure will serve as a guide in establishing a profitable system of business on individual farms with given size, location and soil. This, together with the economic outlook for various crops and livestock as now being regularly printed, will furnish definite and valuable information for basis of recommendation by those organizations interested in the agricultural welfare, such as the County Bankers' Association, the County Extension Service, etc. It is believed that with these two types of information a safe, sane, and constructive policy can be pursued.

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The Latest Approved after many years of Practical Experience

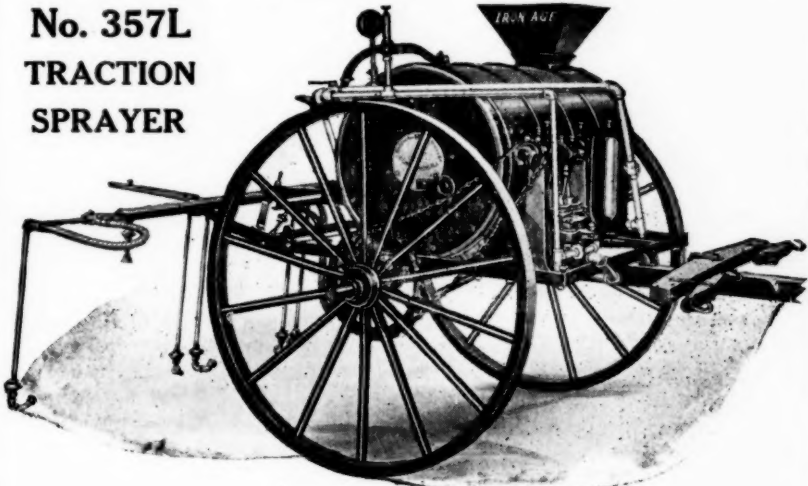
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PROTECT YOUR CROP.

INSURE YOUR PROFIT.

The No. 357L Traction Sprayer shown here has all the strong **IRON AGE** features, the new **Triplex Pump**, the new **IRON AGE Pressure Retainer** and **Pump Relief**, 100-gallon cylindrical tank.

No. 357L TRACTION SPRAYER



As shown here it is equipped with the celebrated twelve-nozzle Drop Bar for spraying four rows. This may be replaced with the regular eight-row Bar.

THE ASSISTED FEED POTATO PLANTER

known as the 100 per cent Planter, is unequalled for absolute accuracy in planting.

THE IRON AGE POTATO DIGGERS,

Traction or Engine-driven, have wide elevator, are easy-running and give thorough separation.

Write for catalogues describing these machines, also Garden Tools, Horse Hoes and Cultivators, etc.

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This study has not been completed yet but certain general indications show that the two factors of quantity and quality are being taken care of by reduction in acreage, especially where farms are not suited for potatoes and change in varieties as indicated by a shift from approximately 80 per cent giants eight years ago to 20 per cent or less in 1924. Added to these, of course, is the very greatly increased use of certified seed and some increase in seed treatment.

GOOD SEED POTATOES AND INCREASED YIELDS

H. R. Talmage, Riverhead, Long Island, N. Y.

Long Island potato tours have become internationally famous among potato men. It was here that good seed was first demanded, in a large way, by potato growers. Ten years ago the term "certified seed" meant nothing to potato growers as it had never been used in connection with potatoes at that time.

When good seed potatoes became available from several sources, in a small way, "Seed Source Tests" were planted on Long Island and the "tour" was arranged to interest as many of our growers as possible in better seed and to get more growers in the north to produce the kind of seed we wanted.

The seed source test has continued ever since. In looking for samples of seed to plant in the test this spring, it was difficult in both Nassau and Suffolk Counties to find any of the old common uncertified seed that used to be the only kind available to plant in the test plots. Does this not refute the statement, commonly made by people who do not know, that "Farmers are slow to adopt improved methods?" Of course, they are slow to adopt much of the advice handed out to them and it is well for the country's food supply that they are.

Unfortunately, "certified seed" and good seed potatoes are not synonymous. Certification tags on seed potato bags, where honestly used, simply say that those potatoes observed by the inspector contain less than a certain maximum amount of a few of the many seed-carried diseases that injure the potato crop. I believe the time is coming when wide-awake potato growers will want to know the strain or pedigree of their seed, just as a dairyman now wants to know the pedigree of the bull that heads his herd. Many of our Long Island potato growers are already depending on strains known to be of the right shape and of high vigor. If we think of certified seed as representing improved seed we must admit that it is responsible for a large increase in the average yield of potatoes throughout the country. The writer has conducted a seed test on his farm since and even before improved seed was available. These tests, running over many years, indicate an increase of 61 bushels per acre of certified seed over common seed.

Many reports of seed tests indicate an increase in yields from certified seed of 25 to 100 per cent, seldom less than 25 per cent except where the common seed was of a very good grade. Certified seed has been available in considerable quantities for several years, and has been widely scattered, many times in small lots; but every lot of improved seed has been the center of an increased use of better seed although only a very small part of it was certified.

Students of potato production are of the opinion that the published figures of total potato production have been too low. If this is true there is no doubt but that the increased yields have been due principally to better seed, with a somewhat increased yield per acre due to better methods of culture, the latter condition having been brought about by the use of improved machinery.

Favorable weather conditions have been given as the reason for the large yield per acre for the country in 1924. Many who are familiar with the benefits derived from the use of certified seed believe a large part of that increase was due to better seed.

Certified seed was produced in large quantities in 1924 and millions of bushels of excellent certified seed will either be hauled to starch factories, fed to stock or shipped to market for table purposes with returns but a little more than enough to pay the freight. This means that improved seed will be used to plant a very large part of the 1925 crop.

A proposed reduction of 4 per cent in acreage planted this spring need cause no undue alarm, even as seems unlikely there was a slight reduction from the 1924 acreage. With an indicated increase of 30 per cent in sweet potato acreage and the general use of improved white potato seed, too many rather than too few potatoes seems likely if we have average growing conditions.

According to reports, there has been a reduction of 20 or 25 per cent in the early acreage along the Atlantic coast. Seed for these plantings has to be brought in with a high freight charge which at best is expensive, and this has been one of the factors influencing the potato growers to use only the best of seed this season. Many reports now indicate that this use of better seed, together with favorable growing conditions, promise a crop equal to, or even greater, than last season's crop in this section.

All of the latest reports from the heavy producing sections of the east indicate no reduction in acreage planted this season. In many important potato sections the growers are in desperate straits and do not know how to make up their losses of recent years except by planting more potatoes. In too many cases there does not seem to be any other crop which can be planted with any hope of profit.

It would be extremely unfortunate and of no ultimate benefit to the country as a whole to have an average growing season and an unprofitably large potato crop brought about by the use of good seed potatoes.

SUMMARY OF METHODS USED BY 300 BUSHEL CLUB MEMBERS IN 1924

Michigan Potato Producers' Association

H. C. Moore, Extension Specialist

The Michigan 300 Bushel Club consisted of 37 members who entered a total of 126½ acres. The average yield per acre was 373 bushels, of which 323.5 bushels were graded U. S. No. 1.

Conditions of the Tubers

There were 11 dark colored lots and 25 were classified as being light colored. Thirty reported hollow heart and seven reported no signs of this deformity. Of the thirty reporting hollow heart, 10 reported from 1 to 5 per cent of the tubers were affected; 8, from 6 to 10 per cent, and 5, with 11 per cent or more.

Nineteen growers reported from a small fraction to 5 per cent oversize potatoes; 7 had from 5 to 10 per cent, and 2 stated that more than 10 per cent of the tubers were oversize.

Soil and Fertilizer

Twenty-six of the thirty-seven club members grew the crop on sandy loam and two on clay loam.

Thirty-one of these champion potato growers used stable manure. Fourteen applied the manure in the preceding summer or fall, and the remaining 17 spread the manure on the potato ground in the spring. The heaviest application of manure was 30 tons per acre and the lightest 4 tons. The average rate was 11.3 tons per acre.

Twenty-eight used commercial fertilizer on the potato crop. The rate of application varied from 200 to 1,800 pounds per acre, the average rate was 614 pounds. The most common analyses used were: 0-10-0, 2-8-6, 2-8-10 and 16 per cent acid phosphate.

Cultural Methods

Thirteen practiced fall plowing and 22 plowed the land for potatoes in the spring. Thirty of these plowed under alfalfa, sweet clover, or clover sod. Four planted potatoes after corn, rye or timothy sod. Two planted potatoes on new ground.

The time of planting varied from the last week in May to the last of June. Four planted their potatoes in May; 18 from June 1st to the 10th; 11 from June 11th to the 18th, and one grower planted on the 28th of June.

All members of the club planted certified seed. Thirty-five planted the Russet Rural variety and the Rural and Green Mountain varieties were each represented once. The rate of seeding varied from 10 to 40 bushels per acre with an average rate of 20.6 bushels. Thirty-six planted cut seed and one used whole seed. The average size of cut seed varied from 1½ to 2 ounces. Thirty-six of these successful potato growers planted their potatoes in drills and one planted in check rows.

The planting distances for a few of the highest yields are: 510 bu. per acre, 33 x 15½ inches; 480 bu. per acre, 34 x 13; 425 bu.

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SEED CUTTERS
 POTATO PLANTERS
 SPRAYERS—Traction
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Our No. 22 Automatic Potato Planter has fulfilled its obligation for many years. Originated 28 years ago. The original Cup Feed Planter—plants the seed without sticking into or bruising. It Plants, covers, marks for the next row and sows fertilizer.

Don't fail to look it over if you are in need of a first class Planter.

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 SULPHATE PRODUCED IS THE PUREST OBTAINABLE
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BORDEAUX MIXTURE

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WATERBURY, CONN.

per acre, 36 x 12; 417 bu. per acre, 34 x 22; 406 bu. per acre, 36 x 16, and 350 bu. per acre, 34 x 12.

The average number of cultivations before the plants were up were two and a half and three and a half times after the plants were up.

Thirty-four used liquid spray and two dusted the growing crop. The average number of sprayings was 5.2.

Cost of Production

The average cost per bushel of growing U. S. No. 1 grade based on 24 reports was 43½ cents per bushel. The highest cost was 75 cents per bushel and the lowest was 20 cents per bushel. Those who can produce potatoes below the average cost of production have a good chance to grow potatoes at a profit.

OUTLOOK FOR ORGANIZED POTATO WORK IN WISCONSIN FOR THE SEASON OF 1925

J. G. Milward, University of Wisconsin

We do not look for any radical change in relation to potato acreage in Wisconsin for the season 1925. There is, as there should be, a conservative attitude on the part of our growers. Potatoes in Wisconsin are for the most part raised in rotation with other crops in regions where dairying is the basic industry. As examples of this condition we can point to two counties—Waupaca County in the central belt and Barron County in upper Wisconsin. In these regions the better class of farmers will not change their plan of farming radically in view of what may be temporary market conditions or unsatisfactory market conditions at the present time. Potatoes, of course, are raised as a specialty crop in this state and in locations where unusual high costs have prevailed, we may expect some reduction. No radical change in these matters is apparent at the present time.

Seed Improvement Work

A decided impetus has been given to the seed improvement work due to the application in the Triumph regions of the tuber index method of mosaic control. The Horticultural Department has indexed around 100 bushels of seed stock this year and has furnished this service to about 15 growers. A certain amount of the better class of certified seed has also been distributed to growers in the state.

Certain changes in the seed stock of the Green Mountain variety has been undertaken in the Green Mountain sections of the state with a view toward making a special study of the spindle tuber situation.

Wisconsin Potato Growers' Association

The legislature now in session on April 23 advanced the Association appropriation bill to final passage, placing the Association

back on the old basis of a state aid organization. There will be a complete reorganization of this work in Wisconsin and the original field work will no doubt be revived.

The season in Wisconsin is well advanced. Rainfall has been adequate and conditions at this date are very satisfactory for preliminary land fitting operations.

THE 1925 LOUISIANA POTATO TOUR

W. Stuart

The third annual potato tour in Louisiana which was held April 14 to 17 proved to be extremely interesting and instructive to those in attendance. As would naturally be expected the itinerary of the tour was much more carefully planned than for the two preceding tours and local interest seemed to be much greater in the campaign for planting of the best seed obtainable. The tour began at Baton Rouge, Tuesday forenoon and ended at Morgan City, Friday night. In the writer's opinion one of the most hopeful as well as helpful outgrowths of the potato tour idea is that of bringing the farmers and the city business men together in a social way for the purpose of discussing the problems of those who produce our food products.

The University potato trial plots were inspected Tuesday forenoon. In these plots there were growing side by side strains of Triumph seed stock from Montana, Nebraska, Minnesota, Wisconsin, Illinois and Vermont. By far the greater proportion of these strains were supplied by Nebraska growers.

Out-of-state men interested in the Triumph strains of seed furnished from their own state spent Monday, April 13 taking disease readings on their home stocks.

It will not be possible in this brief paper to present more than what appears to the writer to be the outstanding features of the trip. The first of these was that the potato crop was suffering from lack of moisture. In some localities this was becoming quite serious, in fact recent advices from Prof. Tiebout indicate that the drought cut the crop 50 per cent or over.

On the Cloverly Farms, at Cut-Off, there were wide variations in the behavior of different strains both as regards stand, vigor of plants and per cent of disease present in the stock. The crop had evidently received good cultivation. Similar conditions were noted at Delta Farm where over 200 acres were being cropped with potatoes.

Uneven stands seemed to be quite general. Here and there fields were noted in which the stand was excellent and the plants were also uniform in size and vigor. Such fields were noted on the farms of Allen Ellenden of Raceland and J. G. Duplantis of Houma. Mr. Duplantis is a typical Acadian and is a comparatively

recent convert to the use of good seed. In 1924 he grew 613.3 bushels of U. S. No. 1 grade of potatoes on five acres of land. When it is remembered that 50 to 60 bushels per acre is considered a good yield of early potatoes in this section one can readily imagine the satisfaction of producing over 120 bushels per acre. Duplantis received \$3.60 per hundredweight for his U. S. No. 1 stock and was handed a check for \$1224.80. This set him to thinking as it was more money than he was making on any other crop. Mr. Duplantis' interest in potatoes is largely the result of his contact with County Agent, George Arceneaux who has urgently and consistently advised his growers to buy certified potatoes.

The only disappointment of the writer during the trip was due to the fact that here and there a grower had been foolish enough to purchase uncertified seed with the result in most cases that his crop was showing a high percentage of diseased plants.

The out-of-state guests were Prof. F. M. Harrington in charge of seed certification in Montana, and Gerald De Witte, president of the Montana Seed Potato Association; Dr. R. W. Goss, Agricultural College, Lincoln, Neb., and K. L. Pierce, banker, seed potato grower, and dealer of Hemingford, Neb.; Dr. P. F. Trowbridge, dean and director of the North Dakota Agricultural College; M. E. Luther, assistant seed certification inspector of Madison, Wis.; K. P. Bemis of the Albert Miller Co., Chicago, Ill.; Dr. R. F. Howard, Wharton, Texas; Frank A. Briggs, editor Farm & Ranch, Dallas, Texas; L. A. Niven, horticultural editor, Progressive Farmer; David Thibault; Fred C. Taylor of the Burlington Route, Denver, Col. and others.

NOZZLES AND PRESSURE IMPORTANT IN SPRAYING

H. B. Stevens

In order to control late blight of potatoes most effectively, the type of nozzle used in the sprayer, the position of the nozzles on the spray boom and the amount of pressure have an important bearing, according to experiments conducted by Dr. O. Butler of the University of New Hampshire. It was found that a pressure of 180 pounds per square inch was most effective, and that where the sprayer was capable of delivering this, three nozzles per row, going over the rows once at a spraying, was sufficient. The nozzles over the center of the row should be directed perpendicularly to the line of motion or at an acute angle, while those spraying in from the side should be set at an angle of 45 degrees. Nozzle caps with an opening of .055-inch diameter gave better protection than ones with an opening of .067 inch. If the sprayer will only deliver a pressure of 90 pounds, two nozzles should be used per row, and the rows gone over twice at a spraying, forward and back. The experiments are related in detail in a circular just issued by the Experiment Station.

ANNOUNCEMENT OF THE 1925 COMMITTEES

Owing to an unavoidable delay in selecting the personnel of the various committees of the Association by President Werner, it was not possible to publish the membership list in the Proceedings. It seems desirable, however, that members of the Association should be advised as to the personnel of each committee. With this end in view, arrangement has been made with the editor of the News Bulletin to publish this list. It is hoped that those who find themselves members of one or more committees will at once get in touch with the chairman of his committee. Furthermore, it is the desire of the officers of the Association that each and every member shall cooperate with the executive committee in making 1925 the banner year of the Association.

Your attention is called to the division of the responsibility of the Research Committee. This subject will now be handled under four heads, viz: **A.** Physiological Investigations; **B.** Pathological Investigations; **C.** Genetics and Seed Improvement, and **D.** Soils and Cultural Investigations.

The handling of each of the above subsections by a small committee headed by a chairman must necessarily increase the efficiency of the work performed and at the same time permit of the selection of men especially interested in the subject assigned them.

W. STUART.

LIST OF COMMITTEES

Research:—R. W. Goss, General Chairman.

A—Physiological Investigations—

C. O. Appleman, Chairman, College Park, Md.
John Bushnell, Exp. Sta., Wooster, O.
J. T. Rosa, Jr., Univ. Farm, Davis, Calif.

B—Pathological Investigations—

R. W. Goss, Chairman, Agr. Coll., Lincoln, Neb.
Donald Folsom, Exp. Sta., Orono, Me.
Freeman Weiss, U. S. Dept. Agr., Washington, D. C.
Chas. W. Hungerford, Univ. Idaho, Moscow, Idaho.

C—Genetics and Seed Improvement—

Fred Krantz, Chairman, Univ. Farm, St. Paul, Minn.
C. H. Myers, Coll. Agr., Ithaca, N. Y.
C. F. Clark, U. S. Dept. Agr., Washington, D. C.

D—Soils and Cultural Investigations—

E. V. Hardenburg, Chairman, Coll. Agr., Ithaca, N. Y.
Oswald Schreiner, U. S. Dept. Agr., Washington, D. C.
H. C. Moore, Agr. Coll. East Lansing, Mich.
W. C. Edmundson, Exp. Sta., Greeley, Col.

Seed Potato Certification—

W. H. Martin, Chairman, Agr. Coll., New Brunswick, N. J.
A. G. Tolaas, Univ. Farm, St. Paul, Minn.
E. L. Newdick, Dept. Agr., Augusta, Maine.
F. M. Harrington, Agr. Coll., Bozeman, Mont.
C. Tice, Dept. Agr., Victoria, B. C., Canada.
George Partridge, Div. Botany, C. E. F., Ottawa, Canada.
H. O. Werner, Agr. Coll., Lincoln, Neb.
M. F. Barrus, Agr. Coll., Ithaca, N. Y.

Varietal Nomenclature and Variety and Strain Testing—

- H. C. Moore, Chairman, Agr. Coll., East Lansing, Mich.
- W. T. Macoun, Central Exp. Farms, Ottawa, Canada.
- P. M. Lombard, U. S. Dept. Agr., Washington, D. C.
- C. A. Zavitz, Agr. Coll., Guelph, Ontario, Canada.
- W. Stuart, U. S. Dept. Agr., Washington, D. C.
- J. G. Milward, College of Agr., Madison, Wis.
- Geo. L. Tiebout, State University, Baton Rouge, La.

Potato Marketings—

- Daniel Dean, Chairman, Nichols, N. Y.
- E. A. Stokdyk, Agr. Coll., Manhattan, Kansas.
- Jas. R. Phelps, Belmont, Nebraska.
- G. M. Waller, Hastings, Florida.
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- Geo. M. Zundel, Agr. Coll., Pullman, Wash.
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- Geo. L. Tiebout, State Univ., Baton Rouge, La.
- J. W. Weston, Agr. Coll., East Lansing, Mich.
- W. Stuart, U. S. Dept. Agr., Washington, D. C.
- W. H. Martin, Agr. Coll., New Brunswick, N. J.
- A. H. McLennan, Agr. Coll., Guelph, Ontario, Canada.

SUGGESTIONS FOR THE RESEARCH COMMITTEE

R. W. Goss, Chairman

I am advised that you are intending to publish the list of names of the various committees of the Potato Association of America. In regard to the Research Committee, I think it might be well to publish a general statement of the policy of this committee now that the names of the members are available.

In notifying the members of the research committee of their appointments I requested suggestions regarding the general policy which should be followed in making these committees more useful to the Association. A number of very good suggestions have been received which I have thought were important enough to be brought to the attention of the members by publication in *The Potato News Bulletin*. This could take the form of a statement of general policy of the Research Committee which could be added to from time to time.

The Research Committee believes that an annual report should be made reviewing the year's investigational work and also containing a list of active projects. In addition to this annual report, however, I believe the Research Committee should take the lead in furthering the active cooperation of all investigators during the entire year. The committee, therefore, extends a cordial invitation to any member of the Association, and particularly to investigators to confer with them at all times and to use the committee as a clearing house for information concerning potato investigations. We hope to have a list of all the workers and the lines of investigation being undertaken, in the hands of committee members as soon as possible. In addition the members have been appointed to a great extent on a regional basis, so that one member of each committee at least will be familiar with the lines of work going on in each section of the country. Many problems merge from one research field into another with which the worker may not be entirely familiar, and the committee could doubtless be of assistance in putting workers in touch with each other, and with the literature bearing on their problems.

The committee would also like to see all investigators use *The Potato News Bulletin* as a source of publication for research items of interest to other workers and to the growers. *The Potato News Bulletin* affords a means of rapid publication for preliminary notes or for results of research work of general interest. It should not, however, be used to obtain priority for preliminary publication, but rather to make immediately available to the workers results which often are not published for a considerable length of time. There are many by-products of research work which are buried indefinitely in the worker's note-book because they are not complete enough to warrant separate publication. The publication of such work as short notes would often be of interest to other workers. Such items

if written in as non-technical a language as possible would also stimulate the interest of potato growers in investigational work more than the complete results of research work that are usually published. They would also afford investigators an opportunity to obtain additional data on their problems from other workers covering a larger field than would otherwise be available.

The success of any policy which the Research Committee adopts depends entirely upon the active cooperation of all workers. The committee can only attempt to point out the way and to offer all possible assistance.

POTATO NOTES

Greeley, Colo.—The following notes were taken from "The Eye", dated May 1, 1925.—"The weather continues dry. There is little snow in the mountains and the prospect is poor for irrigation water under some reservoirs. There is considerable acreage of early potatoes planted in the Gilcrest section. This particular section plants early potatoes exclusively, the larger percentage of the crop being sold to truckers who dispose of the crop in Denver. There is no market for old potatoes at the present time. A few cars were shipped into New Mexico and Texas during the week but most of the late crop is being handled by truckers who are hauling potatoes to nearby towns that are out of the potato district.
—Walter M. Peacock.

Chicago, Illinois.—We have been well pleased with the special ventilation machinery which we installed in our Blue Island warehouse last fall. We have successfully kept potatoes in sack storage since the latter part of November without sprouting, mould or decay. We find the machinery valuable in protecting our stored stock against temperature changes which are often violent at this place. Ventilation reduces shrinkage materially and protects the quality and character of seed stock by holding it dormant until shipping time, which we feel is equally important.

Our Mr. K. P. Bemis and our Prof. R. F. Howard attended the third annual Louisiana tour held recently. Mr. Howard makes his headquarters at Wharton, Texas and is conducting a number of demonstration plots there in cooperation with Texas County Agents. Samples of different strains of seed potatoes are being tested there and checks against similar tests in Northern States. At a recent field meeting at one of these test plots over one hundred farmers and growers were present. Very dry weather has prevailed in the potato sections of Texas and Louisiana and the early crop from the latter state will undoubtedly be short because of this factor.—Albert Miller & Co. May 4th.

Presque Isle, Me.—The following notes were taken from "The Eye", dated May 1, 1925—"The weather continued cold up to Saturday. We are still looking for the usual spring rains and it is doubtful if we get continued fair weather for long. The ground is still cold and there is considerable snow in the woods. Quite a lot of land has been worked and a few potatoes planted. Very few inquiries have been received regarding seed treatment and the writer believes many will not treat their seed this year."—**Walter M. Peacock.**

North Carolina.—I am enclosing some information in regard to the early potato crop in North Carolina for this year. The early crop in North Carolina is one of the most important truck crops produced in the State. Last year shipments totalled over 5,300 carloads. The crop is largely planted in February and harvested in June. This year the acreage has been reduced approximately 12 per cent. The stand is not perfect, probably averaging around 80 per cent. The condition of the crop has been estimated to be 75 per cent. The principal producing and shipping points are Mount Olive, Beaufort, Alliance, Elizabeth City, and Aurora.

Mount Olive shows a decrease in acreage of around 25 per cent with 75 per cent of a stand and condition at 70 per cent. Shipments are expected to start around June 5th.

Beaufort reports a normal acreage with shipments to start about May 17th.

Alliance reports an increase of about 15 per cent in acreage, with 80 per cent stand and condition at 75 per cent. Shipments to start around May 25th.

Elizabeth City reports a reduction of acreage of about 10 per cent, with 85 per cent of a stand and condition at 75 per cent. Shipments will start from this point around June 3rd.

Aurora reports 25 per cent reduction in acreage, with about 80 per cent of a stand, and condition around 75 per cent. Shipments to start about May 20th.—**C. D. Matthews, Horticulturist, North Carolina State College.**

Quebec.—The growers in this area are largely French and they produce small acreages of Irish Cobblers extra early for the Montreal market. The demonstrations of the past two years with certified Irish Cobbler seed have created quite an interest among the growers and this year the seedsmen report very little demand for the uncertified stock. The increase in the use of certified seed will be double that of 1924. For an example, one seed company last year sold three carloads of certified seed and the same firm this year will distribute seven or eight carloads.

This seed is largely obtained from New Brunswick and Prince Edward Island. The practice of greening the seed is spreading as the plots here at the institution have interested all the growers at their annual field day. Many growers who greened a part of their seed before planting last year, have exposed all their seed to the light this year. A few growers are using the traction dusters

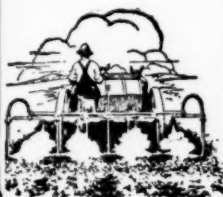
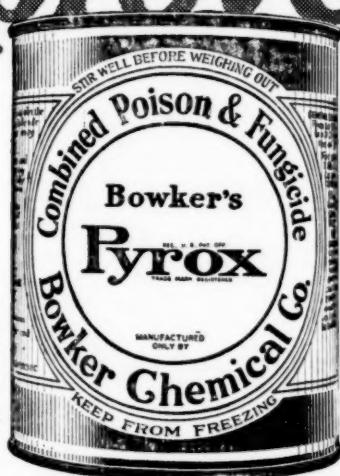
with very satisfactory results as time is a big factor on the market garden farms. Some have already planted small areas, but the past week of showers and cool weather has caused many to delay planting temporarily.

Further efforts will be made this season to increase the use of complete sprays and better machines. The department is arranging to purchase a new power row sprayer for the work here at the college and this machine will be the center of interest at the coming field day.—**W. J. Tawse, Lecturer in Horticulture, MacDonald College, May 5.**

Virginia.—The writer had the opportunity last week to visit the principal potato sections in Eastern Virginia, accompanied by vegetable extension specialists from New York, New Jersey, and Pennsylvania. In the Eastern Shore section, in Accomac County, the Virginia home grown second crop seed lots were just appearing through the ground. As we progressed Southward towards Cape Charles, where the Northern grown seed is planted, we found potatoes from a few inches to twelve inches in height. The stand was quite uniform although the size of plants were somewhat irregular. In the Western Branch section, which is the principal potato growing area in the Norfolk region, potatoes were somewhat larger than on the Eastern Shore, with blooms showing in a few fields, but in many cases the germination was rather poor. The growers have had some difficulty in securing a good stand, due to a number of fungus troubles which were apparently present in the seed potatoes. *Fusarium* and *Rhizoctonia* were present in considerable quantities in certified seed grown in some of our more important Northern seed potato producing sections. The potatoes grown from the seed produced in the mountains of Virginia are showing up exceptionally well this season. It would be well for those in charge of seed inspection in our principal Northern potato growing areas to pay particular attention to the elimination of *Rhizoctonia* and *Fusarium* as well as the virus diseases in the certified seed stock. If disease free seed cannot be secured in the North, the Virginia growers will spare no efforts in having a sufficient supply of seed stock grown in the mountains of Virginia for their own planting, within a very few years. The average condition of growth throughout the section is about normal and if favorable weather conditions prevail for the next few weeks, harvesting will start about May 20th. The growers are worrying more about the price they are likely to receive than the condition of growth.

Colorado potato beetles are present in immense numbers this year, and as soon as the eggs hatch and the larva start working, many of the growers will have considerable dusting to do in order to save the potato foliage.—**H. H. Zimmerly, Horticulturist, May 4.**

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SEED POTATO CERTIFICATION NOTES

MAINE'S 1924 CERTIFIED SEED HISTORY

E. L. Newdick, State Department of Agriculture

Reports on file in the office, nearly up to date, show that there has been shipped by the certified seed inspection service out of Maine since October 1924, 2,377 cars. The writer is not especially interested in telling the world about the number of cars shipped but would like to convey the idea that everything possible has been done to assure the trade of a reasonable degree of protection. At some time or other during the process of shipping, at every car a state inspector has been present and it has taken twelve inspectors on the job all the time to take care of the work.

It would be impossible to ship this number of cars without some complaint and the reasons which the writer believes are the cause for the complaint, lie in the fact that it is not always possible for a good shipper to hire trustworthy men to do the work on the rack. Neither is it possible for an inspector to see every sack that goes over the rack, owing to the expense involved. Right here is left a loop-hole for the worker who is not worthy of his hire and he lets table stock go into the seed sack.

On the other hand, complaint always comes from the men who buy certified seed for the first time and expect too much. They are the hardest men with whom we have to do business. We have had no trouble with men who have been buying in ten and twenty thousand sack orders but the men who buy one car or a portion are apt to be the ones who do not understand the practical side of the potato business and enter an unjust complaint. We realize that we have not reached perfectness by a long ways but we are trying harder each year to give the trade something that is worth while.

We are tightening up on our rules for 1925 and have cut mosaic on the first inspection from five to three per cent; have inserted spindle tuber for the first time and on the second inspection, five per cent spindle tuber will disqualify. These are the two important changes that have been made and we hope that we may be able to have a reasonable degree of luck in determining spindle tuber in the field.

The applications for inspection are not coming as fast as last year. This is probably due to the uncertain condition of the seed market which has caused many of our growers to lose interest in better production. This is to be regretted but when seed is going on the market at less than cost of production, it is hard to keep up enthusiasm among the growers. Early reports seem to indicate that there will be about fifteen thousand acres entered for inspection this year.

VERMONT CERTIFICATION RULES FOR 1925

Harold L. Bailey, State Department of Agriculture

Several changes in the standards for Vermont certified seed potatoes are announced by the State Department of Agriculture.

The limit of tolerance at first inspection for any one of the serious diseases of the plant, including mosaic, leaf-roll, spindle-tuber, yellow dwarf, and giant hill, is cut from four per cent to three per cent. On second inspection one per cent of any one, or five per cent combined, of plants afflicted with these diseases is the maximum allowance.

These changes are in conformity with a general tendency to strengthen the standard of quality of certified seed potatoes, and will maintain Vermont's strong position as a producer of high grade seed stock.

The inclusion of giant hill in the list of serious diseases of the potato is of considerable importance to growers in many parts of the state, and should have an important bearing upon the selection of their seed stock for this season's crop. The action relative to giant hill is the result of a series of careful experiments carried out by Professor A. H. Gilbert, Plant Pathologist of the Department, showing serious effects of the presence of the disease in potato seed stock and its probable relationship to spindle-tuber.

In the rules for grading and sorting 14 ounces has been made the maximum size limit.

NOTES ON RECENT LITERATURE

ANONYMOUS.—Recent German literature on the potato.—*Scot. Jour. Agr.* 6 (1923), No. 2, pp. 199-207, fig. 1.

The principal topics considered in this review of experiments with potatoes in Germany are breeding, seed, fertilizers, and botanical characters.—**H. M. Steece.**

FAGAN, T. W.—The variation in the moisture and nitrogen content of the potato during growth and storage.—*Welsh Jour. Agr.*, 1 (1925), No. 1, pp. 110-113.

Arran Comrade potatoes were grown during 1922 and 1923 near Aberystwyth, Wales, being planted in April and dug in October, when part of the crop was stored in a pit. Samples were taken monthly from June on in the field and from December on in storage.

The principal changes taking place in tubers during growth were a gradual decrease in moisture content and a corresponding increase in dry matter. Similarly the percentage of total nitrogen, excepting the June sample, rose steadily. While the ratio of protein to total nitrogen in the first (June) sample was lower than at any other time, it gradually increased as the season advanced until at harvest it formed from 55 to 58 per cent of the

total. During storage a small increase in the percentage of dry matter and total nitrogen was noted, but the protein: total nitrogen ratio remained fairly constant. The percentages of dry matter, total nitrogen and of protein nitrogen in the total in 1922, a favorable season, were consistently higher than in 1923, indicating an earlier growth and a higher state of maturity in 1922.—H. M. Steece.

GOSS, R. W. AND G. L. PELTIER.—Further studies on the effect of environment on potato degeneration diseases.—*Nebraska Agr. Exp. Sta. Research Bull.* 29, 32 p. 7 pl. 1925.

Continuing previous studies of the same character (Potato News Bull. 1: 154-155) the present authors have investigated the effect of the following factors on the expression of mosaic, spindle-tuber, various combinations of these, and yellow dwarf: 1. light, 2. soil moisture, 3. soil temperature, and 4. air temperature. The observations were made on plants growing in chambers where each of the factors was subject to experimental control. A summary of their conclusions follows: 1. Of the environmental factors studied, light, soil moisture, and soil temperature have little or no effect on the foliage symptoms of any of these disease, but high soil moisture and soil temperature intensify the tuber symptoms of spindle-tuber. These conditions also affect the shape and color of tubers not affected with this disease. 2. Air temperature is the most important of the factors studied in causing the masking of foliage symptoms, but its effects on different diseases are various; thus masking of mosaic is greatest at high temperature, but of spindle-tuber greatest at low. When these diseases were present together, the expression of mosaic was suppressed, and that of spindle-tuber intensified at high air temperature. 3. In addition to suppression of mottling, rugosity, curling, rolling and brittleness, high air temperature (78 degrees F.) eliminated spotting and dropping of leaves in Bliss Triumph. 4. The symptoms of the various mosaic diseases were more pronounced on Green Mountain than on Triumph, and the masking effect of high temperature was less. 5. Masking of symptoms was less marked when combinations of diseases were present. 6. Yellow dwarf appears distinct from the other diseases, the temperature effect being the opposite of that with mosaic. At 78° F. the disease was severe, whereas below 60° symptoms were suppressed. 7. These studies emphasize the necessity of experimenting with a range of controlled air temperature in the recognition, isolation and description of potato degeneration diseases. The fact that other factors have much less pronounced effects greatly simplified this phase of the problem. The various types of mosaic, and combinations with spindle-tuber, identified by Schultz and Folsom, were found to come true to type when they were properly isolated, but contamination with other types readily occurs in the field. Occasional splitting of combinations of diseases in to the separate phases may occur, but rarely, in tubers of a given unit, or in

portions of one tuber. 8. The application of these findings to the recognition of degeneration diseases in the field is discussed. Thus in Nebraska, the most prevalent and destructive type of degeneration disease is spindle-tuber, alone or in combination with mosaic. To detect these combinations it is necessary, in indexing tubers, to make a preliminary reading after the tubers have been sprouted at about 60°, then raise the temperature to 70-75° and make a second reading after 2 weeks. The first reading gives an index of mosaic, the second is to detect spindle-tuber, but if only one reading is made the second gives the best index of the presence of disease.—F. Weiss.

HEADDEN, WILLIAM P.—The effects of nitrates on the composition of the potato.—*Colorado Bulletin* 291 (1924).

During the years 1911 to 1914 inclusive, Colorado potatoes in the Greeley district suffered severe losses from diseases. C. L. Fitch, in an earlier bulletin, attempted to explain the difficulty as due primarily to an unfavorable combination of soil temperature and moisture. The author of this bulletin undertook a series of studies to determine whether such factors as amount and form of available nitrogen in the various soil strata might not have been accountable for the marked activity and effects of certain fungi attacking the potato crop during the above period.

Mass, mechanical and agricultural analyses of the Greeley potato soils and subsoils were made to allow of possible later explanations of the phenomena involved.

The total ash, phosphoric acid and potash analyses of five standard Colorado potato varieties grown with and without the application of sodic nitrate at the rate of 800 pounds per acre are published in tabular form. Owing to the fact that nearly all of the check plots used contained considerable nitrate nitrogen, the summary results given below are not very conclusive.

	Water	Dry Matter	Ash	Fat	Protein	Crude Fiber	N.F.E.
checks	80.18	19.82	1.02	0.10	2.54	0.53	15.24
nitrates	78.78	20.22	1.02	0.09	2.74	0.53	15.88

The author concludes that only in the case of proteins are the above comparisons significant. All forms of this protein nitrogen including ammonia, amino nitrogen and albumin nitrogen were increased by the addition of nitrate of soda.

Application of the nitrate in all cases depressed the phosphoric acid and increased the potash content of the tubers. The indications are that the composition of the potato is radically modified by an excess of nitrates.—E. V. Hardenburg.

OBERSTEIN, OTTO.—Contribution to the relationship of potato varieties, also a guide to the potato variety garden established near Breslau (trans. title)—*Geschäftsführer der Gesellschaft, bei der Ackerbau und Saatzuchtteilung der Landwirtschaftskammer Schlesien*, (1921).

Based on information obtained direct from potato breeders, from the literature and from actual observations taken in a variety test garden established near Breslau, the author presents comprehensive information concerning the origin and relationship of a large number of European potatoes. The parentage of varieties originated by Cimbal, Kameke, Thiele, Trog, Boehm, Richter, Modrom, Dolkowski and Veenhuizer is graphically presented in the form of pedigree charts, so arranged as to show wherever possible the pollen and the ovule parents and those parent varieties which have been particularly productive of valuable progeny.

The grouping and arrangement of the potatoes in the test garden is discussed in connection with brief descriptions of many of the varieties. Following a bibliography of 10 titles, the author includes information concerning the price of certified seed potatoes in 1921 as compared with that of ordinary seed stock.

In addition directions are offered for the trade concerning the size and quality of seed stock and proper methods of handling and shipping and also a short table of cultural recommendations for the small grower.—**J. W. Wellington.**

PAGE, E. M.—Increasing potato yields.—*Missouri Circular 163, March, 1925.*

The author states that a combination of the use of certified seed potatoes, seed treatment and fertilizer have doubled the yield and improved the quality of potatoes for many Missouri growers and have given profitable increases wherever used.

In 1923 the gain by using certified seed was 84.8 bushels and in 1924 62.9 bushels per acre. The cost of certified seed is usually about 25 cents more than for common seed.

Seed treatment demonstrations have shown a better stand and more even and vigorous growth which in 1923 resulted in an increased average yield of 18.3 bushels and in 1924 an increase of 28.6 bushels per acre. The cost of treatment has not exceeded \$1.00 per acre. Seed treatment kills *Rhizoctonia*, common scab and black leg organisms which are carried over on the surface of the tubers. *Rhizoctonia* is the most prevalent and the most serious of these diseases.

The author states that two methods of potato seed treatment are now effectively used to control the diseases mentioned above. The cold corrosive sublimate is still most practical for the farmer who plants only a small quantity of seed. The hot formaldehyde method is more practical for the extensive grower or dealer due to the rapidity of treating the seed.

An average application of 381 pounds of commercial fertilizer per acre on 35 demonstrations in 9 Missouri counties during 1924 gave an average increase in yield of 47.2 bushels per acre at a cost of approximately \$6.00. In 1923 the increase was 44.9 bushels and in 1922 it was 30.6 bushels per acre. On soil of medium fertility 400 to 500 pounds of 3-12-4 fertilizer is recommended; on soils of higher fertility 2-12-2, 2-14-2, or 2-16-2, and for soils low

in potash, such as sandy uplands, a 2-12-6 grade of fertilizer is advised.—**Walter M. Peacock.**

SMITH, A. G.—Virginia mountain grown seed potato demonstrations.—*Proceedings of the American Society for Horticultural Science, 1924.*

The objects of the demonstrations as outlined by the author are two fold. First, to stimulate interest in the use of high grade seed potatoes in Virginia, and second, to create a supply of such seed within the state. To plant the early potato crop in Virginia, 2,500,000 bushels of seed are required of which more than 1,500,000 bushels, or 60 per cent of the whole is purchased from out of state points.

One of the reasons given for growing seed potatoes in Virginia for home use is the uncertainty of getting seed reasonably free from disease and of high yielding strains.

The second phase of the demonstrations deals with finding a cash crop for the beef cattle farmers in the elevated areas of western Virginia. On these high elevations potatoes have never been grown except in gardens. The altitude of the fields where the seed was grown varied from 2,100 to 4,000 feet. The author states that this region seems ideal for the production of good seed potatoes.

Fertilizer and Soils

The mountain fields were located chiefly on Hagerstown loam. The average application of fertilizer was 800 pounds per acre of a 5-8-5 grade. The yield varied around 300 bushels per acre.

Inspection and Certification

The author states that high quality of the seed is maintained through a system of rigid inspections. The seed potato fields were rogued from two to four times. The grading was all done by hand and all off-type or injured tubers removed. Only one variety is grown on a given farm and only one recommended for use in any community.

Storage of Seed Potatoes

Two car loads of the western Virginia grown seed were placed in cold storage early in September and kept there until the first of March. The temperature in the storage was down to 30° F. for an indefinite period and later raised to 36° F. for the remainder of the season. The germination of these were not satisfactory when planted in the spring. Even under fairly favorable conditions they did not germinate uniformly. Twenty barrels were held in cold storage until August 1st. and then allowed to sprout before planting. In this case almost a perfect stand was obtained. Another lot was stored early in the fall on the Eastern Shore under the north side of a barn where excellent natural ventilation was provided. This seed had begun to sprout when planted and gave the highest yield in the demonstration. They came up before northern grown seed.

Eastern Shore Demonstrations

The mountain grown seed gave large yields. The highest yield was obtained from seed grown at 3,000 feet elevation in western Virginia. Second crop immature seed grown on the Eastern Shore will out yield northern grown seed but the former matured from 7 to 10 days later.—**Walter M. Peacock.**

SHUTT, F. T.—Influence of early and late planting and sprouting on the yield and dry matter content of potatoes.—*Canada Exp. Farms, Div. Chem. Rpt. 1923, p. 25.*

The earlier planted unsprouted sets gave larger yields of potatoes with a higher percentage of dry matter in experiments at Beaverlodge, Alta., by W. D. Albright. However, the sprouted series gave results indicating that sprouting before planting may markedly offset the disadvantages of late planting, both as regards yield and dry matter content. Since sprouting previous to planting evidently advances the growth of the plant, sprouted sets may be expected to produce heavier yields and tubers with a higher percentage of dry matter than unsprouted sets when planting is deferred by unfavorable weather.—**H. M. Steece.**

WESTOVER, K. C.—The influence of plot size and replication on experimental error in field trials with potatoes.—*West Virginia Agr. Exp. Sta. Bull. 189, 32 p. 1924 (1925).*

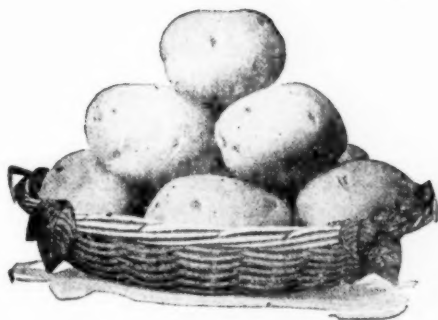
This is a statistical analysis of the yields of potato plots grown in 1922 and 1923 on the same field. The planting plan provided rows spaced 3.5 ft. and plants spaced 10 to 12 in. In 1922 4 strains of Carman No. 3 were compared; in 1923 only 1 strain was grown. In determining the most efficient size of single-row plots, the yields of 10 ft. portions were taken separately, then variously combined to give plots up to 60 ft. in length. The standard deviation for each size of plot was determined together with its probable error, and also the probable error of a single determination. Comparison between plots of different size was made on the basis that the difference in variability is significant only when the standard deviation exceeds its probable error by 3 times, and that the reduction in error is significant only as the actual reduction of probable error does not diverge widely from the curve of theoretical probable error. On this basis significant differences in variability were first encountered when the plot size reached 40 ft., but were not maintained through further extensions up to 60 feet (or beyond). Similarly points of inflection on the curves of actual probable error as compared with the theoretical curves were uniformly noted at this same plot length. The conclusion is reached that a 40 ft. single row is a convenient and statistically trustworthy unit. In the same way it is shown that with plots of this length replication 4 times (5 plots in all) shows a satisfactory agreement in reduction of error with the theoretical curve, and that no significant further reduction of error is obtained by replications up to 7.—**F. Weiss.**

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